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HEARING ON FLOOD CONTROL INFRASTRUCTURE: SAFETY QUESTIONS  
RAISED BY CURRENT EVENTS

Wednesday, March 1, 2017

United States Senate

Committee on Environment and Public Works

Washington, D.C.

The committee met, pursuant to notice, at 10:34 a.m. in room 406, Dirksen Senate Office Building, the Honorable John Barrasso [chairman of the committee] presiding.

Present: Senators Barrasso, Carper, Inhofe, Capito, Wicker, Fischer, Moran, Rounds, Ernst, Cardin, Whitehouse, Gillibrand, Booker, Markey, and Harris.

STATEMENT OF THE HONORABLE JOHN BARRASSO, A UNITED STATES  
SENATOR FROM THE STATE OF WYOMING

Senator Barrasso. Good morning. I call this hearing to order.

President Trump has made improving our Nation's infrastructure a top priority, and this Committee is continuing its effort to highlight our Nation's infrastructure needs.

As I have stated, infrastructure is critical to our Nation's prosperity. In personal meetings, I have met with members of this Committee, both sides of the aisle, and I will tell you that infrastructure is always listed as a top priority. It is a priority because it is a driver of our Nation's economy and it impacts every community.

This Committee has a long history of working together in a bipartisan way on infrastructure issues. I want to continue that tradition.

The Senate Environment and Public Works Committee has sweeping jurisdiction over our Nation's infrastructure. Our last hearing focused on highways and roads, and the needs of rural water systems, all of which are within this Committee's purview. Recent natural weather events in the last month in California and in other western States are highlighting the need to focus our attention on our levees and our dams and other

structures that prevent catastrophic flooding in both rural and urban communities.

Earlier this month, more than 180,000 people were evacuated in California because storms caused serious damage to the Oroville Dam, the tallest dam in the United States. The potential threat of dam failure is a serious concern, a concern to State officials and to people living downstream of Oroville. Any future severe weather event could make the situation even more critical, and it is raising questions about the readiness of our flood prevention infrastructure.

Dams and levees across the Country need to be modernized and maintained if we are to prevent future disasters. So I believe any infrastructure bill that this Committee develops should consider the need to maintain and modernize these structures.

Winter weather events aren't just affecting California, but are occurring across the West, hitting towns big and small. These events include ice jam flooding in Northern Wyoming along the Big Horn River, in the towns of Worland, Manderson, Greybull, as well as towns located to the south like Riverton, Lander, Hudson, and areas of the Wind River Reservation.

This past month the ice jam floods have damaged over 100 homes in Worland, a city of roughly 5,000 people, so these floods have serious and lasting impacts.

In the past, blocks of ice the size of cars sit for weeks on playgrounds and front lawns. The river ice damages everything from public structures like water treatment plants and public parks to private homes and small businesses. These ice jams are regular occurrences harming small towns not just in Wyoming, but in other parts and States from the Dakotas to Upstate New York.

For these small towns, the cost of cleanup and repair is an enormous burden from which it takes months to fully recover. In certain instances, flooding could be mitigated by the Army Corps providing more flexibility in allowing towns to take the steps they need to protect their communities.

Our Committee has jurisdiction over the environmental laws that impact the modernization of infrastructure. Oftentimes, in rural States, Federal one-size-fits-all rules can have absurd results on the ground. If we are moving a tree or a pile of dirt which might only take days to accomplish can make a difference in preventing a catastrophic flood, a town shouldn't have to go through a lengthy bureaucratic process to remove those features while the town floods yearly.

Bureaucratic red tape should be cut where people's lives and property are on the line, which is always the case when we are talking about flooding.

Dams and levees are the most common infrastructure to address flooding. However, new technology can also help mitigate the threat of flooding, including ice jams. I include language in Title I of the Water Resources Development Act this Committee enacted last Congress creating an Army Corps Pilot Program to develop innovative and cost-saving technology to address the threat of ice jams. The program needs to be implemented.

I would also like to note that in the past two WRDA bills this Committee provided additional authority to both the Corps and to FEMA to help States, local governments, and dam owners address deficient levees and dams. It is time to implement these authorities.

I also would like to hear what else this Committee and the Army Corps can do to improve existing infrastructure, building new infrastructure, reduce red tape, and develop lifesaving technology and materials to prevent flooding.

Now, with that, I now want to turn to Ranking Member Carper for his statement.

[The prepared statement of Senator Barrasso follows:]

STATEMENT OF THE HONORABLE THOMAS R. CARPER, A UNITED STATES  
SENATOR FROM THE STATE OF DELAWARE

Senator Carper. Thanks, Mr. Chairman. Thanks very much for bringing us together.

We welcome all of you. We are glad that you are here. You could be at a lot of different places, but it is important that you be here. We look forward to your testimonies and to the opportunity to ask some questions, just to have a good conversation.

The Chairman and I talk a lot about Mike Enzi's 80/20 rule. Mike Enzi is a Senator from Wyoming and he talks about the 80/20 rule as something that he and Ted Kennedy used to lead something called HELP, the Health, Education, and Pension Committee. And I would say to him, how does one of the most liberal Democrats and one of the most conservative Republicans get so much done, provide leadership to this Committee? And Mike said, we believe in the 80/20 rule. I said, what is that? And he said, Ted and I agree on 80 percent of the stuff, we disagree on 20 percent of the stuff, and what we focus on is the 80 percent where we agree.

Senator Barrasso and I agree on a lot. We especially agree on the need to invest wisely in infrastructure. Fortunately, it is not an especially partisan issue, as we heard last night in the President's State of the Union Address, although it was

preciously short on how to pay for stuff, which is always the challenge, how to pay for stuff. It is easy to figure out how to spend the money; not so easy to figure out how to pay for it.

Democratic Senators continue to press for a consensus on the issue of infrastructure. It appears to me that we are one of the few Senate committees here, EPW, really talking about working on a bill in a bipartisan comprehensive way and intent on doing that, and I applaud our Chairman for his leadership there and for Jim Inhofe's leadership before that. I believe that members on both sides of the aisle feel an urgent need to move forward on a comprehensive infrastructure package, but in a thoughtful way, rather than to kick the can down the road, something that we are pretty good at here.

As a recovering governor, I judge any legislation that makes these kinds of investments by asking a simple question, and that question is this: How does this proposal, whatever the proposal of the day is, how does it help create a more nurturing environment for job creation and job preservation? That is what I actually ask.

In addition to answering that question, I also believe something Lincoln used to say when Lincoln was asked a long time ago what is the role of government, and he replied, famously, the role of government is to do for the people what they cannot do for themselves. Wise words.

Flood control investments are not ones that average citizens can make for themselves, as you know. Not only do the construction of dams and levees create jobs, but these investments can also support local economies, help drive commerce, and put our communities on a path to civility.

One of the things that businesses need most is predictability and certainty, and they don't need floods and the kind of havoc that that can create for their community and for their businesses. So it is important that we make investments, because when dams and levees fail, they can result in loss of life and, as we know, economic destabilization and even economic devastation.

But as we work through this hearing and other infrastructure oversight and policy decisions, I think that we will struggle with maybe two central points. One is what is the role of Federal, State, and local government in addressing these infrastructure concerns, and, also, are the three levels of government up to the challenge. Are the three levels of government up to the challenge?

Something called the McKinsey Global Institute put out a 2013 report that you may be familiar with that said that we need to invest between \$150 billion and \$180 billion a year more in infrastructure at large just to make up for years of underinvestment that is hindering our Country on a multitude of

levels, from limiting economic growth to threatening our personal safety.

This comprehensive report, which I commend for your reading, looks at all components of infrastructure, but this message of drastic need is easily applicable to what we are talking about today, and that is flood control.

The same report found that one of the best ways to invest and get the most out of our dollars is to maintain existing infrastructure. That probably doesn't come as a surprise to any of you. But whether it is a bridge or a dam, our Government has a fundamental responsibility to make sure that those structures are sound and continue to serve for their intended purpose, including protecting the lives that are impacted by the bridge or a dam's very existence.

As I mentioned earlier, infrastructure investment is critical for our economy in part because of the direct jobs we create from the construction and from the restoration work, as well as the displaced workers that we can bring back into our workforce. They want to work. If they can actually do this work, then let's turn them loose. But just as important are the lives and property that are protected by these projects.

I am particularly looking forward to hearing from our friends from California, the Secretary of Natural Resources, John Laird, on his experience with the Oroville Dam and about

California's nationally recognized flood safety program. I think it is critically important that we learn from each other's experience and that we take that shared knowledge forward through the legislative process.

In closing, the critical infrastructure of our Country is aging and in need of significant capital investment to help our economy continue to grow. The 2013 infrastructure report card issued by the American Society of Civil Engineers gave us a D, as in dog, to roads, drinking water, wastewater infrastructure; and then waterways and levees received a D-; ports of sea, bridges about a C+.

As we hear testimony, I am particularly interested in hearing how our witnesses think about the roles of the different levels of government, where there are gaps that need to be filled, and as it relates to protecting investing in and maintaining critical infrastructure such as levees and dams.

The concept of shared responsibility has been an overarching theme in many of our conversations. I am sure we will continue that conversation today.

I also hope to hear some thoughts on the concept of natural infrastructure protection as it relates to flood safety.

Finally, while traditional forms of infrastructure like roads and ports are essential to our economy, I feel that we need more investment to protect our natural infrastructure as

well, such as our shorelines and our wetland ecosystems, and thanks very much to the Army Corps for all you do in that regard. Without these protections, risks to manmade infrastructure significantly increase and in many cases become unmanageable.

Finally, I am interested in how the Federal Government can be more efficient with our current funding streams and get the most out of every dollar of Federal investment, and I want to know how we can make sure that we are prioritizing the most critical investments and ensuring that we maintain the assets we have first, before building new assets that we can't afford.

No one-size-fits-all approach to solve our problems. We have to work across the aisle. I am encouraged that under the leadership of this man here we will.

Mr. Chairman, with that, I would ask unanimous consent that the testimony of American Rivers be submitted for the record, please.

Senator Barrasso. Without objection.

Senator Carper. Thank you so much.

[The referenced information follows:]

Senator Carper. Thanks very much.

[The prepared statement of Senator Carper follows:]

Senator Barrasso. We have a number of guests here.

Senator Ernst, could I invite you to please introduce your guest to the Committee?

Senator Ernst. Thank you, Mr. Chair. I want to thank you, as well, for holding this important hearing today, and thank you for working with me to extend an invitation to a great Iowan on the panel today. I am pleased to introduce the mayor of Cedar Rapids, Mr. Ron Corbett, to this Committee. Mayor Corbett has been working tirelessly on behalf of the citizens of Cedar Rapids securing State and local funding to rebuild his community after the 2008 flood, and what they have done is truly impressive.

But critical assistance from the Corps is also needed to complete Cedar Rapids' flood risk management project, and this is something Mayor Corbett has been leading the charge on for years now. Cedar Rapids and communities across my State are in need of Corps assistance, but have run into hurdles trying to navigate the bureaucracy within the Corps and OMB. They just point fingers at each other, and it is an issue that we are trying to work through and resolve not just for the people of Cedar Rapids, for many communities across the State of Iowa and the Nation.

So we continue working through this. We also know that the City of Des Moines also has important levee work that needs to

be done, and Cedar Falls has been working on a 408 permit application that still isn't approved.

In addition, how the current system is set up to calculate the economic benefits of flood control projects places Iowans at a disadvantage. The current metrics that the Corps and the Administration use prioritizes building beaches in front of multimillion dollar oceanfront homes over protecting the people of Cedar Rapids because the calculations are based on property value.

Cedar Rapids is Iowa's second largest city, and its success is critical to the economic well-being of the entire State. They have endured two significant flooding events in eight years that have cost billions of dollars in devastation and recovery aid. The Corps has some discretion to help, and have simply made the decision to forego the assistance, even though the community worked with the Corps to develop a project to address that flood risk and worked with Congress to get it authorized.

So I look forward to the discussion today and, Mayor Corbett, thank you. I know you will be detailing for this Committee Cedar Rapids' very, very important story.

I am also eager to continue my conversation with you, General Semonite, thank you for being here today, to see if we can move forward on this.

Thank you very much, Mr. Chair.

Senator Barrasso. Thank you, Senator Ernst.

Senator Harris, could I invite you to introduce your guest?

Senator Harris. Thank you, Mr. Chairman and Ranking Member Carper for scheduling this important hearing, as recent events in my home State highlight the necessity of Congress's support in assisting our State and local partners to maintain, repair, and upgrade our Nation's aging infrastructure, and especially when it comes to critical systems that could threaten the public safety of all Americans.

It is my distinct pleasure to introduce the Secretary of the California Natural Resources Agency, John Laird. Secretary Laird has over 40 years of experience working in public service, ranging from a budget analyst for then-U.S. Representative Jerome Waldie, a local elected official as Santa Cruz City Councilman and Mayor, and as a State legislator where he chaired the California Assembly budget committee. And I had the pleasure of working with him throughout those years, both when I was district attorney of San Francisco and as attorney general.

In his current role as Secretary of Natural Resources, he manages California's ecological and cultural resources, water reserves and supplies, and statewide environmental policies. Within his agency, he oversees 30 sub-departments, including the California Department of Water Resources, which is the lead

agency working around the clock to repair Oroville Dam and to prevent catastrophic flooding.

Mr. Chairman, last week Secretary Laird and I had a chance to tour the Oroville Dam together, and he had an extraordinary understanding of the technical needs of the dam and levee infrastructure. I also want to comment that as he and I both noticed, it was an extraordinary example at the dam of Federal, State, and local agencies coming together to meet a need that was really a crisis in terms of its proportion. We saw folks that ranged from members of the National Guard, the United States Navy, FEMA, and California Emergency Services, together with the local sheriff, Butte County Sheriff Kory Honea, who came together to meet the challenge and the need, and they did it in a seamless way.

And it goes without saying that Secretary Laird has extensive knowledge of the needs of our Nation and the needs that we should consider when it comes to sufficiently maintaining our infrastructure and flood management systems. This, combined with his budgetary experience at all levels of Government, can shed light on how Congress should leverage funding streams to help address our aging infrastructure.

I know that in California alone there are approximately 1,400 dams, and nearly half of those are designated as "high hazard potential dams" by State officials. Realizing the

devastation that could be caused by an aging dam infrastructure, California has invested approximately \$11 billion in flood control management in the past decade to protect nearly 7 million people and \$580 billion worth of assets, which include buildings, farmland, and crops, that are at risk.

The need for improvements aren't solely in California. For example, in States like Wyoming, we have invested more than \$1.2 billion of their State's funding for water infrastructure improvements, water storage, and supply projects, recycled and wastewater management and treatment, and drought and emergency relief water programs since 1975.

In addition, according to the Association of State Dam Safety Officials, it is estimated that non-federally owned dams throughout our Nation represent 96 percent of all dams in the United States and would need more than \$60 billion to sufficiently repair, which is a third of the cost that is urgently needed to repair the high hazard dams identified by the Association. This demonstrates that the need is great across our Nation, and that is why I greatly appreciate the Chairman's willingness to continue prioritizing this conversation, and I look forward to working with my colleagues on this Committee to continue Federal support that is necessary and yet critical to maintain our infrastructure nationwide.

I look forward to hearing from you, Mr. Secretary.

Welcome. And I appreciate all the members of the Committee and other witnesses for being here to discuss this crucial topic.

Thank you.

Senator Inhofe. [Presiding.] Well, thank you, Senator Harris. That was a very nice introduction.

Senator Harris. Thank you.

Senator Inhofe. Let me explain to everyone where we are today. I am alone. We have votes going on. I have already voted the first time. Several others will be voting and coming back. Now, I would say this, though, that there is staff from each member who is here today, so we are going to start with opening statements, and we will start with you, General Semonite. And if Senator Barrasso is not back, we are going to skip you, I say to our next witness, and go to the third, because he wants to be here during your opening statement.

General, you are on.

STATEMENT OF LIEUTENANT GENERAL TODD T. SEMONITE, COMMANDING  
GENERAL AND CHIEF OF ENGINEERS, U.S. ARMY CORPS OF ENGINEERS

General Semonite. Chairman Barrasso, Senator Inhofe, Ranking Member Carper, and distinguished members of the Committee, I am Lieutenant General Todd Semonite, Commanding General of the Corps of Engineers and the 54th Chief of Engineers. Thank you for the opportunity to be here today to discuss the role of the United States Army Corps of Engineers in dam and levee safety.

One of the Corps' primary objectives in constructing, operating, and maintaining dam and levee infrastructure is to reduce risk to public safety. Our efforts in this area are part of a larger array of management practices aimed to ensure our Nation is postured to safely enjoy a range of water resources benefits. For dam and levee safety, the Corps uses a risk-informed approach to ensure that these objectives are met in a transparent and disciplined manner.

Water plays a central role in the strength of our economy, the health of our community, and the diversity of our ecosystems. Unfortunately, many of our Nation has experienced what happens when we have too little water, too much water, or water that is not fit to consume or sustain natural habitat. In many ways the decisions that we have made as a Nation in developing, managing, and protecting our water resources have

influenced how the Nation developed and where its people now live. The Nation's water resource infrastructure includes dams and levees built by the Federal Government, States, local authorities, and the private sector. Sustaining the benefits of these structures requires the appropriate investment of resources and the proper management of the risks that come with those benefits.

Although often planned and constructed as individual projects, many of our Nation's dams and levees now operate as integrated components of a much larger water resource management system. The Corps owns and operates only a small fraction of the dams and levees in the Nation. Our portfolio includes 715 dams, which is less than 1 percent of over 90,000 structures identified in a 2016 national inventory of dams. The Corps also operates and maintains roughly 2,500 miles of levees, which is less than 10 percent of the roughly 30,000 miles now in the national levee inventory. From a functional perspective, the Corps generally constructed the dams and levees that it owns and operates to provide navigation or flood risk management benefits. However, many of these structures also support other uses, such as hydropower, water supply, and recreation.

Over time, these facilities have aged and deteriorated, and can only sustain their intended function with regular maintenance and periodic rehabilitation. In addition, many

external factors will complicate efforts to sustain the viability of this infrastructure. Variables ranging from the frequency and intensity of natural hydrologic and seismic events to the sizes of the populations living and working near the infrastructure compound the difficulty of decision-making.

The Corps is addressing these challenges in a risk-informed manner. We make informed adjustments to ensure that resources are invested in an efficient and technically robust manner. For example, our dam safety program enables the Corps to extend the period that a project can provide some or all of its authorized benefits by investing in measures that reduce the principal safety risk at our dams to an acceptable level.

When it comes to addressing our Nation's dam and levee safety challenges, the Corps' responsibilities generally follow project-specific authorities for managing infrastructure that the Corps owns and operates. The Corps also has programmatic authorities for participating in the national community of dam and levee safety. In reaching decisions on potential safety measures at the dams or levees that it owns and operates, the Corps considers the public safety, economic and environmental risks posed by the infrastructure, the cost of reducing those risks, and the authorized project benefits that a proposed safety improvement would enable the project to continue to provide to society.

In summary, dams and levees are an important part of the Nation's water resource initiative. Management practices are aimed to ensure our Nation is well positioned to safely monitor and manage water resource infrastructure. For the dams and levees that our Corps owns and operates, we are working to balance the cost, responsibilities, risks and benefits in order to inform our decisions that guide the safe operation, proper maintenance, and effective management of risk. A similar framework of risk-informed management may also help meet these objectives for decisions on the safety of other dams and levees across the Nation.

I am honored to lead the United States Army Corps of Engineers, and I appreciate the opportunity to testify today and look forward to answering your questions. Senator Carper asked is the Government up to this challenge. The Corps of Engineers is up to this challenge. The vision of the Corps is to be able to engineer solutions for the Nation's most critical challenges. We have the capacity and the competency to do just that.

Thank you, sir.

[The prepared statement of General Semonite follows:]

Senator Inhofe. Thank you, General Semonite.

Commissioner Wolf, we will pass over you temporarily and go to Mayor Corbett.

STATEMENT OF THE HONORABLE RON CORBETT, MAYOR, CEDAR RAPIDS,  
IOWA

Mr. Corbett. Thank you, Chairman Barrasso and Ranking Member Carper, Senator Ernst, Senators and staff members. On behalf of the citizens of Cedar Rapids and the people of eastern Iowa that work every day in Cedar Rapids, thanks for giving us an opportunity to tell our story today.

In June of 2008, the Cedar River in Cedar Rapids crested more than 10 feet above any previous flood, at 31 feet. The unthinkable happened. The floodwaters covered 10 square miles, which is 14 percent of our city. 6,865 residential properties, 754 commercial industrial properties, 310 city facilities were damaged, totaling more than \$5.4 billion in losses. The flood devastated our residents, our businesses, our entire community.

But not all was lost. There are two things we didn't lose, Senators. One, we didn't lose any lives. Thanks to our emergency response team and the hundreds of boat rescues, no lives were lost in our community. And if you think about it, in the various disasters in each of your respective States and around the Country, oftentimes, during the news reports of the disaster, included in those reports is the death toll; and in Cedar Rapids no lives were lost. And in some bizarre way, today we feel, nine years later, the fact that we were so successful in saving lives, that that maybe goes against us.

And the second thing that wasn't lost was our will to rebuild our city stronger and better than what it was before the flood.

So as damaging and catastrophic of the 2008 floods, our recovery has been equally impressive by any standard. With your help, through FEMA, HUD, the Justice Department, along with the State and local government, the private sector, the nonprofit sector, the faith community, we began that journey to rebuild Cedar Rapids building by building, house by house, neighborhood by neighborhood. That included our infrastructure of water and sewer. Quite remarkable.

But as we were rebuilding, we always had one eye on the future, and that future meant a permanent flood protection system in Cedar Rapids. That confidence that our business community had and our residents had to reinvest, and the momentum that we have gained, has all been based on having long-term flood protection. So from the beginning we have been working with the Corps, and we were so anxious when the Corps was ready to reveal their plan for Cedar Rapids, only to unveil the plan that protected just one side of the river.

Imagine being a mayor or a resident of a community when you are told you are allowed to protect one side, but the other side isn't. How do you say that lives on one side of your river are worthy, but lives on the other side of the river are not worthy?

I asked why, and they said it is because of the benefit-cost ratio, a formula, some algorithm. Senators, we don't govern Cedar Rapids based on an algorithm. We rejected the benefit-cost ratio and worked with the State to develop a funding mechanism to protect the west side.

So here we are, nine years later, finding ourselves again disadvantaged by the benefit-cost ratio. It is based on value of property. And when Cedar Rapids is compared to other communities around the Country, we come up a little shorter because the values in our community or smaller Midwestern States just are not equal to the value in the larger communities.

This past September we had another event. We were able to win this time over the river, so we have evened the score. The river 1, community now 1. But now we know it is not a question of if it will flood again, but when. And we need to have that long-term flood protection for our community, so again, Senators, we seek your help.

Thank you.

[The prepared statement of Mr. Corbett follows:]

Senator Barrasso. [Presiding.] Well, thank you very much, Mayor Corbett.

You may have noticed people are coming and going. We are in the middle of two votes, so we will continue to come back and forth.

At this time, though, I would like to turn to Commissioner Terry Wolf, who is Chairman of the Washakie County Commission in Worland, Wyoming. He is a former member of the Wyoming Army National Guard, has a degree in administration of justice from the University of Wyoming.

Commissioner Wolf moved back to Worland in 1995 to work in the oil and gas industry. Upon transitioning out of the National Guard, Commissioner Wolf ran for a seat on the Washakie County Commission, was sworn into office January of 2003. He was past President of the Wyoming County Commissioners Association, currently Vice President of the Wyoming Association of County Officers. Also serves on the National Association of Counties Public Land Steering Committee, and during his 15 years as a county commissioner he has represented the county as a federal cooperating agency on the Big Horn National Forest Plan revision and the Big Horn Basin BLM Resource Management Plan revision.

So I want to welcome you to the Committee, Commissioner Wolf. I want to thank you for agreeing to testify here today.

I see you have a number of other commissioners from the State of Wyoming who are here to cheer you on, and I see Pete Obermueller here, who is also the Executive Director of the Wyoming County Commission Association.

Commissioner Wolf.

STATEMENT OF THE HONORABLE TERRY WOLF, CHAIRMAN, WASHAKIE COUNTY  
COMMISSIONERS, WYOMING

Mr. Wolf. Good morning, Chairman Barrasso, Ranking Member Carper, and distinguished members of the Committee. Thank you for the opportunity to speak today. My name is Terry Wolf. I am the Chairman of the Board of County Commissioners in Washakie County, Wyoming. Washakie County is located in rural northwest Wyoming, with an annual revenue of only \$8 million. It is the third poorest county in Wyoming. Washakie is one of four counties in the Big Horn Basin. You can find a map in Appendix A in my written testimony. This area of Wyoming is well known for its sugar beets that are grown and processed into pure U.S.-made sugar for consumption. The high yield of agriculture production is dependent upon the Big Horn River.

Unfortunately, this same river that brings so much life also brings destruction to our communities in the spring when ice blocks the size of trucks and weighing up to 300,000 pounds jam up and block the flow of the river. The ice jams push the water over the banks and into the communities in Worland, Manderson, Basin, and Greybull, flooding homes and businesses and threatening the sugar processing plant that I already mentioned.

Mr. Chairman, I want to direct your attention to the before and after photos on the easel of the flooding that occurred in

Worland on February 11th of this year. In the before photos you can see, in the foreground, an island in the middle of the river that was formed from sediment buildup over the course of years. In the after photos you get a clear picture of the ice blocks creating a dam at that island and causing the flooding.

Over the course of a week, city, county, State officials, the Wyoming National Guard, and numerous volunteers worked tirelessly to protect public and private property and critical infrastructure threatened by the flood. We are still evaluating total cost to our communities in damage cleanup, but estimates will likely exceed \$150,000.

While this flood is heartbreaking by itself, what is important for the Committee to know is what happened in Worland a couple weeks ago is almost identical to the flooding in 2014. That same island gathered and held ice blocks and pushed over the Big Horn River into Worland, costing State and local governments nearly \$200,000 in recovery costs. For a rural county like Washakie, these costs are difficult to bear.

For a clear picture of the sediment buildup on this island, I direct your attention to the next aerial photos that show the 20-year span of buildup on that island. We at the local level must confront this issue because the exact same flooding is likely to occur year after year, depending on the severity of the winter. Following the 2014 flood, we pursued the

possibility of removing the island. Initial estimates at the time indicated that the removal of 1.7 acres of area at a depth of at least 5 feet, requiring 1,700 truckloads would ensure free-flowing passage of ice blocks.

While a project like this is very small for an agency like the Army Corps, it is much too large for a community as small as ours to tackle on our own. Section 205 of the Flood Control Act of 1948 authorizes the Army Corps of Engineers to partner with local and State agencies on small damage reduction projects not specifically authorized by Congress. While we initially pursued a Section 205 project in 2015, we backed off after inquiries uncovered the likelihood of difficult and expensive bureaucratic hurdles and the potential of more stringent environmental permits to remove the sediment island.

Additionally, while the Federal share of costs associated with these small projects is significant, we were concerned that the local share was still much more than the rural agricultural-based county could meet. Finally, it appeared that the Army Corps simply hadn't used the Section 205 program for ice jams to the extent it had for other more traditional flood damage control measures in other areas of the Country and, therefore, may not have believed it had the flexibility necessary to deal effectively with the problem.

With that in mind, we were pleased to see Congress include language specific to ice jams in the Water Infrastructure Improvement Act for the Nation, passed just two months ago, in December 2016. That language requires that the Corps identify and carry out not fewer than 10 projects to demonstrate technologies and designs developed to prevent and mitigate flood damages associated with ice jams.

Removal of the island appears to be the solution to our flooding in Worland, but at the local level we are flexible enough to explore other options if the Army Corps is flexible enough to make use of this new language to research and explore cost-effective technologies to mitigate what is likely to be a repeated disaster in our area. We remain concerned about the monetary and human capital costs associated with these projects. However, Washakie County stands ready to work alongside the Army Corps of Engineers on any viable and cost-effective solution for the protection of our community. We hope that Washakie County and the Big Horn River will be among the first of the cold region pilot projects.

Seasonal runoff or unique weather events are things over which we have no control, but floods caused by ice jams and a sediment island in the Big Horn River is something we can control with the Assistance of the Army Corps of Engineers. I am here to ask both the Corps and for your help to ensure that,

as you move forward with funding infrastructure projects of great importance to the Nation, you do not forget about these small projects in rural areas that are of critical importance to our local communities.

Thank you, Mr. Chairman.

[The prepared statement of Mr. Wolf follows:]

Senator Barrasso. Well, thank you so much, Commissioner Wolf. We look forward to questions.

If we could turn now to Secretary John Laird. Mr. Secretary.

STATEMENT OF SECRETARY JOHN LAIRD, DEPUTY SECRETARY FOR EXTERNAL AFFAIRS, CALIFORNIA NATURAL RESOURCES AGENCY

Mr. Laird. Thank you very much, Mr. Chairman, and also Ranking Member Carper, Senator Harris, and members of the Committee. On behalf of the State of California and Governor Brown, I thank you for the opportunity to provide testimony before this Committee at this particularly vital time on our issues.

As you know, our Nation's aging infrastructure is at a crossroads. One path is characterized by inaction, putting human lives, our natural resources, and the economy at risk; another path is shaped by deliberative policies, meaningful investment, coordination across all levels of government, and the incorporation of new science that can provide multiple benefits to common outcomes. Right now California approaches this situation with a sense of urgency.

Droughts and floods have always driven the evolution and growth of California water policy investment and scientific/technical understanding. This year is no different.

But after five years of the driest seasons in modern times, California is now in the midst of what is likely to be the wettest season on record, in the history of recordkeeping in California. This just demonstrates that California has the most variable weather of any State in the Nation and often depends on

the bounty of just four or five storms per season to support our water system.

The number, size, and severity of storms this water year has strained the State's flood control and water management infrastructure, forcing evacuations, damaging roads, destroying homes, communities, and livelihoods. It is estimated that damage to California's highways alone from the storms this year is \$595 million thus far.

Most dramatically, damage to the main spillway on the Oroville Dam, the second largest reservoir in California, and, as the Chair said in his opening comments, the largest dam in the Nation, serves as the keystone of the California water project, and it was observed on February 7th by water managers. Damage to the main spillway and rapid erosion of the emergency spillway led to the emergency evacuation of nearly 200,000 downstream residents in Yuba, Sutter, and Butte Counties.

With crews working around the clock, the danger has since passed and residents have returned home. The reservoir remains, right now, at at least 50 feet below the capacity level, and repairs continue as dam operators plan for an extended flood season due to an extremely high snowpack.

Over the last decade alone, over \$11 billion has been spent by Federal, State, and local agencies in California on flood control projects. California's extraordinary response to this

year's storms was only possible due to local, State, and Federal cooperation and significant prior investments.

California has the leading dam safety program in the Nation, as recognized in a peer review by the Association of State Dam Safety Officials. But we can and must always do better.

This event has drawn much needed attention to the age, condition, maintenance, and financial needs of California and the Nation's flood control and water management systems. We should use the opportunity that is presented by this situation to invest in existing infrastructure and fund innovative projects that leverage science to meet the challenge of extreme weather and variable precipitation, and accomplish multiple benefits and goals within the investment.

While we welcome the partnership, California is not waiting for the Federal Government alone to meet this urgent need and real opportunity. As a first step, last Friday, Governor Brown redirected \$50 million from the State's General Fund and requested a \$387 million Proposition 1 appropriation from the State legislature to fund near-term flood control and emergency response actions.

To complement the immediate actions of our State agencies, as Secretary of Natural Resources, I have requested the following actions from our partner Federal agencies: that we

expand inspection and review of all federally-owned dams in California and parallel to California's efforts; to update the Federal operating manuals for key California reservoirs. It is imperative to revise these manuals to reflect current scientific knowledge. The Corps needs to be fully funded to complete these updates or allow non-Federal authorities to finance the work. My letter asked that we fund the recently enacted Water Infrastructure Improvements for the Nation Act, which authorizes a program for rehabilitation of high hazard dams at FEMA. Also, prioritize the publication of the program's rules to assist California and other States in this rehabilitation effort.

So we have an opportunity and we really look forward to working with our Federal partners, and I look forward to being able to answer questions.

[The prepared statement of Mr. Laird follows:]

Senator Barrasso. Thank you very much for being with us  
and for sharing your insight, Secretary Laird.

Mr. Larson.

STATEMENT OF LARRY A. LARSON, P.E., CFM, DIRECTOR  
EMERITUS/SENIOR POLICY ADVISOR, ASSOCIATION OF STATE FLOODPLAIN  
MANAGERS INC., WISCONSIN

Mr. Larson. Thank you, Chairman Barrasso, Ranking Member Carper, and the rest of the Committee staff.

I have been working in the water resources profession for 55 years. In fact, my first job out of engineering school was to work for the California DWR on the State water project, which, as you know, the Oroville Dam is the key.

I also, for 25 years, ran the dam safety program and the floodplain management program in the State of Wisconsin.

The Association of State Floodplain Managers represents 17,000 professionals across the Nation who manage flood risks to reduce flood losses every day. This includes both structural and non-structural approaches, such as land use, building permits, community planning, mapping, stormwater management, and the rest. We have been very concerned about the status of the Nation's flood risk management infrastructure, and in light of the ever-increasing rainfall intensity we get even more worried.

Some of our major concerns include this. Flood damages in the Nation are really unknown. We don't know how much floods cost us every year. That is a real problem.

Flood mapping. In order for communities and States to effectively manage flood risk, they need flood maps, and good

flood maps. Of the 3.5 million miles of rivers and coastlines in the United States, the NFIP has mapped about 1.5 of them, and only half of that has a 100-year flood elevation that they need to regulate properties.

The NFIP maps are the base flood maps used by all those 22,000 communities, all the States, and all the Federal agencies. They may build off of them, but they start with them.

The NFIP now has a good process for mapping and could map all communities in the Nation in 12 years if fully funded as authorized.

Topography is also key. The USGS has a digital elevation program called 3DEP, and they, if funded, can do the mapping for the Nation in the next eight years.

Residual risk mapping. One of the key areas this Nation has ignored is residual risk, below dams and behind levees, areas that will flood when structures either overtop or fail. However, even if dam failure maps are available, Federal Government policy is not to release the maps to the public. We don't quite understand that. No one knows how the risk is if they are in a risk zone. It is not appropriate that they find that out at 2 a.m., when law enforcement knocks on their door and says you have to leave. We must figure out how to solve that problem.

And we must be forward-thinking on national standards. We need standards for dams and levees both. You in Congress have set up programs in the Corps to develop levee standard and FEMA to develop dam standards. Neither of those are funded, however, and we must get on with that.

Add to this low standard the fact that we have mapped and built flood infrastructure to yesterday's flood, and not tomorrow's flood, I am pleased to hear that I think California is doing more of that all the time, and the rest of us need to do that too. We need to figure out how to keep those low hazard dams from becoming high hazard dams because development occurs downstream. There are a couple of States that have figured that out, and we need to do it nationally.

We are pleased to see the Congress and Administration looking at the issue of infrastructure, but our experience shows that financial incentives are very difficult to apply to these projects versus other kinds of projects. Private financing will not suffice. We are going to have substantial Federal investment in this, as well as State and local investment.

Private investors tell us that they need national standards to ensure that what they are funding, or might fund, is designed, constructed, operated, and maintained to appropriate national standards. Investments should look beyond structural

flood control. Non-structural projects, stormwater management, green infrastructure, nature-based approaches are appropriate.

Funding should also serve to help build State capability. You realize only the States have the authority to oversee private dams and levees. The Federal Government cannot tell a private dam or levee owner to fix a dam or fix a levee; the States have that authority, if they use it. I have run programs that do have that.

You set up some process in WIIN to build State capability in dams, but that must be funded to get underway. It is a smart investment of taxpayer money.

In conclusion, the U.S. is facing a substantial need to repair and upgrade, and sometimes remove, our flood control structure. If you simply appropriated the programs you have already authorized in the flood risk management program, the 3DEP, the national levee safety program, the national dam safety program, we would make a big step. The threatened failure of Oroville Dam and the actual failure of 80 dams in South Carolina in the past two years points out that we have a public wake-up call.

Thank you very much.

[The prepared statement of Mr. Larson follows:]

Senator Inhofe. [Presiding.] Thank you. I just noticed, it was called to my attention, that Senator Grassley has come and seated behind Mayor Corbett. Did you want to be recognized for anything?

Senator Grassley. I didn't come here to mess anything up.

Senator Inhofe. All right. Well, then don't mess anything up. That's good.

Senator Grassley. I just wanted to make sure you understand that Iowa, and particularly Cedar Rapids [inaudible].

Senator Inhofe. Well, I didn't tell him that Cumberland and Anita, Iowa is where all of my family was born, so we are sensitive to those problems.

I will begin, because the Chairman is voting now, then we will go to Senator Carper.

General Semonite, in my hometown of Tulsa we have nearly 20 miles of levee, a system that was built by the Corps of Engineers back in the 1940s. We have about 10,000 people living within that. We have \$2 billion of infrastructure, including a refinery, a very large refinery. Seventy years old, they are desperate and in need of repair and upgrades. Congress authorized a feasibility study and expedited budget consideration in last year's WIIN Act. That was our effort. With the risk assessment taking over a year longer than promised, Tulsa is concerned about more delays in the lack of

the Corps prioritizing the project. It is my hope that we can get this done.

Now, I am sure that you looked at that before, in preparing for this hearing. Our concern is these are old and there is not a week that goes by when I am back that this isn't called to my attention. What kind of a commitment can you make that we are going to get this thing started?

General Semonite. Thanks, Senator. You bring up a good point. When you talk about levees, I think right now we have about 15,000 miles of levees that we constructed, but the Corps actually only has about 2,500 of those that we actually maintain. So we have to be able to continue to reach out to find out what can we do to assist. Several people here have talked about everybody has to pull their share to be able to work side-by-side. On this particular one, this goes back to that flood risk management study and to be able to make sure that we can review this, get this thing done, and understand how we are going to be able to come through on that.

I don't know exactly the details of where we are at on that, and I would like to have my staff come back to you on it.

Senator Inhofe. It would be a good idea. And I would like to ask that you personally look at this because it is something that should not have gone this long and it is critical.

Secondly, I only have one more question, then we will go to Senator Carper. That is, General Semonite, while I have you here, I wanted to raise a concern of mine. Congress has authorized and, in fact, made it a priority for the Corps to work with private partners to develop and maintain recreational areas at Corps lakes. However, there seems to be an anti-development mentality within the Corps, at least within the Tulsa district, that I think needs to be overcome. In fact, I am going to give you a quote, a senior staff member within the Tulsa district told my State director, and this is a direct quote, he said, "If I had my way, I would end the lake development altogether."

I would just like to ask you does this reflect a philosophy within the Corps that you are willing to talk about?

General Semonite. Sir, it certainly does not reflect our Corps philosophy. We are very aggressive on continuing to find many, many different options on recreation. Some of these are Corps-owned and Corps-maintained. There are other ones where we have concessions to come in and do recreation.

Senator Inhofe. But is one option to end all development?

General Semonite. No, sir. I think every one of these projects is different. I don't know the exact details of what was said, but our philosophy is to continue to look at how we can continue to partner with the stakeholders and to try to

continue to find a good compromise solution on that. So I will find out what is out there and get back with you, okay, sir?

Senator Inhofe. Oh, that is good. Thank you, General.

Senator Carper.

Senator Carper. Thanks, Mr. Chairman.

To our friends, welcome. Senator Grassley, nice to see you out there in the audience. You have the back of your mayor there. Good work.

Before I say anything, I just want to say to General Semonite how much we in the Del Marva Peninsula appreciate the opportunity to work with the Philadelphia Regional Office. The folks there, you have terrific people and we are grateful for all the good that they do with their lives on behalf of the folks that we serve in Delaware, the eastern shore of Maryland, eastern shore of Virginia. So thanks.

We sometimes get to work with your folks from the Maryland office, the Baltimore Office.

General Semonite. Yes, sir.

Senator Carper. We are grateful for that too.

Someone mentioned, I don't know, maybe it was Mr. Larson, somebody mentioned the funding, and I understand that in some cases we have passed legislation authorizing new support for non-Federal dam repair and rehabilitation efforts beyond the traditional Federal role. We haven't appropriated the money. I

am reminded of a law in this Country called mandates, unfunded mandates law. That is it, unfunded mandates law, where we basically set standards and say you have to do this, but we don't provide the money to do it.

I don't know if that is the situation here or not. Is it?

Mr. Larson. Well, that was in the WIIN that set up that grant program with FEMA. That has not been funded. And the first thing that has to happen when it is funded is FEMA needs to put together experts nationwide to put together standards for dams for design, construction, operation, and maintenance; and then with that in mind they can set up criteria for which dams they fund and make sure that the work is done appropriately. We need those national standards and that program needs to be funded. Now, that is the one that was just passed in December, so this is your first crack at trying to get it funded this round of funding.

Senator Carper. All right, thanks.

Back to General Semonite. Events such as the near failure of the spillways at Lake Oroville have further highlighted the issues and risks associated with dams near populated areas, as you know. Although the Federal role in dam rehabilitation and repair traditionally has been focused on rehabilitation of Federal facilities and support for State dam safety programs, some have argued for an increased Federal role in non-Federal

dam safety and rehabilitation, sort of following up on what I was asking Mr. Larson.

But, in particular, recently passed legislation I have alluded to authorized new support for non-Federal dam repair and rehabilitation efforts beyond traditional Federal role. The extent to which these authorities are funded remains to be seen. We will get a budget from the President and the Administration hopefully in a couple weeks, and we will have an opportunity to see what they suggest; do hearings and move forward.

But, General, aside from funding these critical programs, what more could the Federal Government do to address the risks posed by failing levee and dam infrastructure?

General Semonite. Senator, that is a great question, and this panel today really is the perfect time to ask that question because these rivers, these flood management structures are all intertwined. This is a system, so you will have some Federal, you will have State, local, and private. All of it has to work together. Anything that one element does is going to affect the other.

So clearly we have some Federal structures, but I think the other thing is we have an awful lot of expertise. We have 5,000 certified dam and flood control experts in the Corps that not only take care of our 715, but are more than available to go to other places. Oroville is a great example. We have 50 people

out there that have been working for the last several weeks side-by-side with John's guys to continue to be able to make sure we are looking at what can we do to mitigate the current risk, but also to be able to make sure what about be able to rebuild, and how can we use some of the lessons learned in the Federal areas to be able to go back in and help the State.

Same thing, some of the things that these gentlemen are doing here may be great opportunities out in the field. How do we wrap those back in to learn how to run our Federal systems better? So I think it is a shared understanding of the technical competence to be able to make sure that we are all working side-by-side.

Senator Carper. Okay. I was going to ask a question relating to shared responsibility. I think you pretty well answered that, so I am going to ask a question, maybe a first cousin of that.

How can States, particularly smaller States like our State of Delaware, ones with coastline, coordinate and/or pool resources to help the Corps complete bigger and more efficient flood control projects?

General Semonite. Sir, obviously some studies, if there are some things out there. I mean, we have an unbelievable relationship all through the vertical team, and our districts are talking to the States and imbedded in the States, if there

are some things where we think we can lean on some of the State expertise to be able to help get justification or to be able to have better understanding of the return on investment. Senator Barrasso talked about the value of making sure we are making the taxpayers' dollars go a little bit further. I don't know if I have an exact answer back into Delaware, but wherever we can team with this Federal team to be able to make this whole system more resilient, that is what we are really trying to do.

Senator Carper. All right, thanks so much.

Senator Barrasso. [Presiding.] Senator Capito.

Senator Capito. Thank you, Mr. Chairman.

Thank all of you. I would like to ask General Semonite a question, just prefacing it by reminding those who are watching and the General himself might recall that last summer West Virginia had one in a thousand-year flood occurrence that took the lives of, I think, 23 West Virginians lost their life. It was very fast and the Corps has been trying to repair these communities and these waterways.

So my question is in the WRDA bill that we passed at the end of last year, I am just kind of putting this feather back into your cap to remind you that the Secretary will conduct studies to determine the feasibility of implementing projects for flood risk management, ecosystem restoration, navigation water supply, recreation, and other water resources in the

Kanawha River Basin, which is pretty much fully encompassed in this southern part of West Virginia, but also Virginia and North Carolina. So I am just asking you, General, to make a commitment that you are moving forward on that study and what we might expect from that.

General Semonite. Yes, Senator. We will certainly do that. You talked about how fast that happened. I think you had 10 inches of rain in less than 24 hours.

Senator Capito. Right.

General Semonite. This is where we are seeing, whether it is climate change or other hydrological events, the surge of some of the flash opportunities here is unbelievable and we have to be able to negate that risk. But we definitely will have that commitment to continue to support.

Senator Capito. Thank you so much. And that gets me to another question connected with that particular incident. Howard's Creek, which is not a large body of water, it sounds small, it is a larger creek, but it is the one that rose and really took so many lives so quickly. So when you are looking at small waterways, is the best use of your resources in these, because there are so many, you obviously can't be everywhere, is to train the local, not just State, but even locals to try to take this opportunity to improve Howard's Creek so this doesn't

happen again? I mean, is that how you move forward from something like this?

General Semonite. Yes, Senator. There is obviously a lot of flood fighting that can be done to be able to mitigate this. I think the mayor from Cedar Rapids made a very good point: all lives are just as critical; all property is just as important wherever you are living in the United States. So whether it is a large facility or a small facility, a large river or a small stream, we are just as committed to be able to partner to make sure that we can mitigate those damages that are out there.

If that is not done through structural, and we had some good discussions here, it is a lot of those other components. How do you do that through training? How do we make sure that we have some of the greener aspects to be able to do it, whether it is zoning and other things? How the vertical team all represented here can share some of those lessons learned to be able to make sure communities have that capability, I think that is an important tool.

Senator Capito. Well, thank you. I think that is good and I am sure the City of Cedar Rapids had that rapid rise as well, and it was very costly.

I want to shift to dams. We live in a mountainous State. We have hundreds, I think 614 dams. Most of them have been studied, although several of them, high hazard dams, have not

been rated, rated as in r-a-t-e-d. So we can't just tell are they satisfactory, poor, unsatisfactory, or where their rating is.

How can we prioritize our projects if we don't have full-out rating and accurate information on the existing dams that we have throughout the States?

General Semonite. So, Senator, let me give you at least the Federal perspective. On our 715 dams, they are rated, we know exactly where they are at. There are five different rating code and, if need be, I can tell you exactly where the Federal inventory and portfolio are with respect to that.

Senator Capito. Okay.

General Semonite. I think the challenge is the Federal rating system, which is a very robust rating system, how does that then get incorporated into States, local, local communities, and even private communities so that then, somewhere, we have the ability to understand how to rack and sack them. The Corps does run the dam safety database. We have 12,000 dams that are in that database. I think we have to go back and look at the standards, and if there are some areas where we haven't had the level of fidelity in the rating, then we will go back and do whatever we can to help advise how we can do that better.

I am not necessarily aware that there is contention there; I think it is just how do we continue to do a better job on that.

Senator Capito. Well, you know, in fall fairness to the State, the State has six people working in this area. When you have 700 structures and other issues that they are dealing with, it is a manpower issue, it is technical issue. So I am glad to know that, with your expertise at the Corps -- and the Huntington Corps is really most, but we do have some Pittsburgh Corps too, I want to give them a shout out, they have been very good. We also have some Baltimore Corps, so they are doing well. Our State, with its odd shape, we get good exposure to the Corps. I will say that. And we have lots of water.

So I appreciate your willingness to coordinate with our State to make sure that we get these dams and these structures up safe. Also for these fast water occurrences, which we just had another one again this morning, we need to be able to cope better on the ground. We are great at recovering and helping people, but prevention is where we would really like to be. So I appreciate your input here.

Thank you.

Senator Barrasso. Thank you, Senator Capito.

Senator Whitehouse.

Senator Whitehouse. Thank you, Chairman. I am delighted that we are having this issue. I want to take a minute to respond to the point that Mr. Larson made, which I think is incredibly important, particularly for us who are here representing coastal States.

One of the basic facts about climate change is that the vast majority of the heat that has hit the planet and is trapped here as a result of climate change, as a result of our carbon emissions, has been absorbed by the oceans. I see the General nodding. Of course. The oceans are our great cooling system, and the excess heat goes into the oceans in enormous amounts. And there is a very basic physics proposition called the law of thermal expansion, so when the ocean gets warmer, it rises. And for coastal States we are seeing real problems. We have 9 feet of sea level rise projected for this century along Rhode Island's shores. Nine feet of sea level rise.

This shows itself already in places like this. These are summer cottages along our Rhode Island coast, and this is after a recent storm. And the lady who owns that house, I remember speaking to her. She was about maybe 60-plus years old, and she remembers as a little girl that house had a yard. They could play in the yard of it. And on the other side of the yard was a road that people could drive down to the beach in, and then there was a little parking area where the cars could park that

had come down the little road, and on the other side of the little parking area was a beach which she remembers as a little girl was a long run across the beach in the hot sun to get her feet into the cool water from the hot sand of the beach.

All of that is gone now and the house has gone into the sea. We are seeing this over and over and over again, and it is worsening and it is accelerating. So people may want to quarrel about climate change here for a variety of reasons, but this is not funny along our coasts. It is for real.

Here is Downtown Newport just after Sandy, which missed us, by the way. This is a very small side effect of the big hit that was nearby. And this is not ordinarily kayakable, as you can see from the stores that have their floors filled with the harbor, basically.

So the problem that we have that I would like to make sure the General is listening to as well is exactly what Mr. Larson said. He said that when you are dealing with this problem, you need flood maps, and you need good flood maps; and what we are preparing for is yesterday's flood and not tomorrow's flood.

I think I have quoted you correctly, Mr. Larson.

In Rhode Island we have done our own independent review of FEMA's coastal flood mapping, and our Coastal Resources Management Agency and our university find that the FEMA maps are, frankly, just dead wrong. They have all sorts of errors.

They fall way short of incorporating experienced levels of storm surge. They don't accurately reflect dune protection for the land behind it; they exaggerate dune protection by amounts that are really astonishing. They rely on very outdated models. The models are so bad that when they run the transects in the model along the beach, showing where the harm is going to be, they find a 5-foot differentiation at the model line in some of their transects. That is a symptom of a flawed model, when you have 5-foot differentiations.

And the result is that the flood mapping along our shores, and I think along other shores as well, is badly erroneous, which means that a lot of people who are depending on FEMA flood mapping to assess the risk to their homes are being misinformed. And we really need to get this right, because if it is happening in Rhode Island, it is happening everywhere. A number of the other States that have cross-checked what their data is against the FEMA models show that the FEMA models are a failure. When we have asked FEMA to recreate its modeling, they can't go back and recreate the models, which is another very strong sign of a failure in the process.

So when I am forced to look at homes like this going into the water, that families have, in some cases, had for generations, they have been passed on and on, like I said, this isn't funny. And it is bad enough when this body won't pay any

attention to climate change, for reasons that I won't go into here, and it is hitting home in this way in my home State, but then when we have to try to quantify the damage and we don't get good information because FEMA simply has it wrong, that is very significant.

My time has expired. I wanted to emphasize Mr. Larson's point.

I thank you, Chairman, for hosting this and allowing him to bring it forward.

General, this is not your Army Corps problem; this is a FEMA problem, but to the extent that the Army corps and FEMA interact on so much of this coastal stuff, I want to make sure you know and take home how badly their mapping fares against a professional assessment done by the affected States.

With that, I will conclude. I thank you.

Senator Barrasso. Thank you, Senator Whitehouse.

Senator Rounds.

Senator Rounds. Thank you, Mr. Chairman.

General Semonite, first of all, thank you for your service. We appreciate you being here today. We appreciate what you do on a regular basis. I just wanted to talk a little bit about I am from South Dakota and we have the Missouri River, which comes right down to the middle of our State. We have the main stem dams, which provide a huge amount of benefit and most certainly

has been a good thing for our State, along with all of the States surrounding us.

I am becoming increasingly concerned about the potential for Missouri River flooding as a result, this year, of the snowpack levels and the decrease in available storage capacity in the Missouri River reservoirs. Through regular communication with the Corps and the South Dakota Department of Environment and Natural Resources, it has come to our attention that mountain snowpack levels are about 133 percent of average between the Fort Peck and the Garrison basins.

What is the Army Corps' plan to manage water levels in the Missouri to prevent flooding along the upper Missouri this year? I know that right now NOAA is predicting above average precipitation in the coming weeks. Does the Corps have concerns about the increased risk of flooding that could be caused by above average rainfall, and what is the Corps doing to address these concerns? This is one of the major issues that occurred in 2011 and we have a lot of folks out there that are watching the fact that we are just at the flood level, just at the base of the exclusive flood control today. Where is the Corps at right now and what do you anticipate in terms of your ability to manage what may very well be some significant inflows?

General Semonite. Senator, great question. Yes, the Corps is very concerned about snowpack across all of the United

States. We are watching California very, very closely right now. Through any of these systems, you know, several years ago we had scenarios where, if you get too much snow, then obviously you can't be able to bring down the flood pool enough to be able to absorb that. So we watch it the best we can. This was authorized in WRDA 2014.

The challenge, I think, is the ability to be able to do the monitoring and the modeling to do that. Right now we don't necessarily have appropriated funds to go to the next level to be able to model that to a higher extreme, so we are doing the best we can. We are taking the tools that are available. I think the question is are we able to project what that would equate to when it comes back to what is going to happen to those pools.

So that is not a good answer, but the bottom line is we are always concerned about snowpack. I am not sure that we have the fidelity right now and the science to be able to understand as much as we would like to know on how that is going to project.

Senator Rounds. We had major floods in 2011. The Corps actually did an in-house review and actually asked for outside folks to come in and help them. They recommended that you have additional monitoring equipment put into the plains area. That was in 2014. You have had 2015, 2016, 2017. Now coming up on 2018. This last summer we had field hearings in which

representatives from the Corps told us exactly what you did just now, and that was you didn't have the appropriation.

I don't think, in looking back at it in our review, that it has ever even been requested. What I would like to know, number one, is are you planning on putting in a request for it? And, second of all, if you did, since you are not going to have it this year, do you have plans to at least attempt to modify by releasing some early flows so that we don't have the possibility of the kind of floods that we had in 2011?

General Semonite. Sir, I have to get back with you on that to be able to make sure I understand exactly the details of what we are prepared to do. I know there are some funding challenges. That is not, obviously, acceptable, but the bottom line is I think we are doing everything we can with the funds available to be able to project what is going to happen.

We are concerned and we look at what those projections could be. We clearly have the authority under the water control manuals to be able to start bringing that water down just based on the analysis we have right now.

I owe you a better answer, sir, on what we can do to be able to fix that.

Senator Rounds. There is a real interest on the part of the upper basin after 2011. A lot of people out there are concerned right now because they can see the water levels, as

well, and they can read the reports. Do you have any plans for communication with local communities along the way in terms of the review that you are doing? In 2011, it seemed to me that one of the biggest concerns, matter of fact, March 3rd of 2011, in a report in the Omaha Herald, one of the officials indicated that we are going to be just fine this year, unless it rains. That is not a way to run a major main stem system, and I am hoping that that is not going to be the comment this year, that we are relying on lower or less than normal rainfall downstream. If that is the case, we have real problems.

General Semonite. Yes, sir. And to address your issue on the collaboration, we are talking every single day back and forth with the hydraulic experts, back into the State, to the local communities. We want to be very transparent and collaborative on how we can do that to make sure that we are learning from you and you are learning from us. But right now our goal is to try to continue to be able to bring those capabilities down to be able to absorb whatever we think we would project for that snowpack that is coming.

Senator Rounds. Would you continue to provide input or at least to provide information on at least a biweekly basis to the local communities about where you are at in the flood control and any plans you have for some perhaps more stable early

releases to relieve some of the flow along the Missouri later on?

General Semonite. Sir, I certainly see no reason why we can't do that. I would think we would be doing it now. Most of our stuff is, a lot of times, posted on the Web so it can be 24/7, everybody can see what we are doing, we are seeing the same thing from the State. If there is any reason why we aren't being as collaborative, as transparent as we should be, I will fix that.

Senator Rounds. I think more than anything else we really want to know is whether or not you are prepared, since flood control is the number one priority along there, that if we are up into the exclusive flood storage position already, which I believe we have just entered into in the first week in March, that you are prepared to begin to take actions to release perhaps some additional flows to mitigate what might be some significant flows in a shorter period of time later on.

General Semonite. Senator, I certainly want to try to make that happen. Every one of those facilities has specific authorizations and different rule curves on how they will work. I want to make sure that we are operating inside the authorities and the parameters that we have established in the law and those rule curves to be able to make sure we are doing it.

Yes, I think we want to meet that intent. I want to make sure, though, that we are doing it in the authority of our current water control manuals.

Senator Rounds. I know my time has expired, but what I am getting at, General, and with all due respect, sir, flood control is the number one priority, and that would be above navigation needs or above other types of needs. Flood control is number one. Am I correctly stating that?

General Semonite. Sir, life safety, without a doubt, is number one.

Senator Rounds. Thank you, sir. I appreciate it. And, once again, thank you for your service. I know you have a tough job to do there. Thank you.

Senator Barrasso. Thank you, Senator Rounds.

Senator Harris.

Senator Harris. Secretary Laird, you and I know about the longstanding debates in California about water. A very famous person once said whiskey is for drinking; water is for fighting. So one place in California that highlights that point is the Sacramento-San Joaquin Delta.

Will you talk a little bit about your observations and analysis of the infrastructure in the Delta? It is often the subject of debate about where that precious water goes in terms of the farmers who rely on it and also environmentalists who are

concerned, rightly, about the endangered species that live in that body of water. And that seems to occupy a lot of the discussion about the Delta.

But I have a concern about another point, which is that we may not have that debate if the infrastructure that supports the Delta is compromised or is weak in any way.

So, please, if you could address that.

Mr. Laird.

Thank you, Senator. That is a very good question. For the uninitiated, all those rivers flow into the one place, and then through an estuary to the ocean, and there are hundreds and hundreds of miles of levees that have created what are known as the Delta Islands, which are farmed, which have been farmed in a way that now they have dropped to 20 or 25 feet below sea level. And they are protected by levees that were originally constructed to be agricultural levees and not high protection urban levees.

And we just had a break in the last two weeks in the middle of a storm. The Delta Island flooded, and it will be hard to clean up and repair. And the challenges are Senator Whitehouse mentioned sea level rise. If there is a 1 foot sea level rise, it would change a flood event in the western Delta from 100 years to 10 years, meaning more frequency.

With the subsidence in these islands, if there were a major seismic event and a number of these levees failed, salt water would actually drain from the San Francisco Bay into the Delta and you would have real difficulty recovering farmland. There might be an interruption of water supply.

So the question is it is a huge ticket to do all the repair work that might need to be done. The voters, in 2006, brought \$3 billion to the table. The voters, in 2014, brought \$7.5 billion to the table for everything, the flood control we are talking about here, storage, and some of these levee improvements. So we know we have a lot to do. We are trying to do the high priority projects, and it is a complex system.

The one other thing is some of these islands are not very highly inhabited, so the one where they did the evacuations for the levee breach in the last two weeks, they evacuated 20 homes. You can imagine if that is the tax base to do the kind of repairs that need to be done. It looks to State and Federal and other entities to really help or else you can't complete it.

Senator Harris. And to emphasize the significance of it, that body of water is the largest estuary on the west coast, isn't that correct?

Mr. Laird. It is.

Senator Harris. And the farmland that that body of water supports produces 50 percent of the fruits and vegetables consumed by the Nation.

Mr. Laird. The Federal and State water projects together in the Central Valley provide water to 3 million acres of irrigated agriculture. So the question is there could be an interruption in water supply for that, but there could be just damage to farmland itself in the Delta with how the breaks happen.

Senator Harris. So how can my colleagues and I support what California needs to do to make sure that the infrastructure around that body of water, in addition to the Oroville Dam, is supported, understanding that the ramifications are pretty extreme and national in terms of the exposure and consequence if we don't repair it?

Mr. Laird. I think that, really, we are bringing all this money to the table, and the question is, within the flexibility of the Federal Government, can you have loan guarantees. Only three percent of the dams in California are State dams, so there are some places where there are local districts or there are private entities, utility companies have a number of these dams, that a loan guarantee would make all the difference in terms of them being able to finance the repairs or the upkeep. And

obviously if there is an infrastructure bank or revolving loan funds or other things, those would be helpful as well.

If you look at the Central Valley of California, it flooded regularly for 80 years, from statehood into the 1930s, and there were two reasons: they couldn't correctly measure how much water was going by and everything that was designed was not really designed for the capacity. But the Federal Government stepped in in the 1930s and joined with the State and locals, and, with that breadth of economic support, that brought the modern flood system with weirs and levees and other things that Sacramento is second only to New Orleans in danger from a catastrophic flood event, and it is that effort that has protected Sacramento and other areas in that time.

Senator Harris. Thank you.

Thank you.

Senator Barrasso. Thank you, Senator Harris.

Senator Ernst.

Senator Ernst. Thank you, Mr. Chair.

Mayor Corbett, thanks again for being here. Mayor, do you believe the safety of your citizens and the economic security of your region is vulnerable because you haven't been able to get the critical assistance that we talked about earlier from the Corps? And, if so, could you explain further on that?

Mr. Corbett. Thank you, Senator. Yes, our community is vulnerable not just from a life safety standpoint, but from an economic standpoint. As I made mention in my opening remarks, the recovery of Cedar Rapids has been phenomenal, as we actually gained population in the last census and the business community has reinvested in our town. So we do have that momentum and that restored confidence in our community.

Now, we haven't sat idly by the last nine years since the flood. We have actually been working locally to incorporate flood mitigation efforts in our town. Right after the flood, the recession hit four months later. Our own citizens voted for a sales tax referendum, an increase of one penny for 60 months, to help provide additional resources to our community; and our State government stepped up. You know it very well, you were there in the State legislature and approved a funding mechanism when the Corps, through the cost-benefit ratio, said that they could only even recommend protecting the east side of Cedar Rapids, and not the west side.

We rejected that formula that said one side of town was worthy; the other side of town wasn't worthy. Our mechanism with the State is going to pay 100 percent of the west side flood protection. So our ask of the Federal Government is just the 65 percent for east side flood protection. But until there are some changes in the cost-benefit ratio, we are going to be

compared with other communities around the Country that just have higher property values.

Senator Ernst. Yes, absolutely. Quite well put, Mayor. I want to thank you for the hard work that you have done for the community of Cedar Rapids and for the State of Iowa. Thank you.

General Semonite, it is good to see you again. Thank you for taking the time to sit down with me and go over these tough issues.

I wrote to you last fall, asking about how human safety is considered in the decision process to budget and fund flood risk reduction projects. The Corps then sent me a letter back, in December, stating that these decisions are determined on a case-by-case basis. And then a list was provided to me of the fiscal year 2017 projects that were funded for construction because of the significant risks they pose to human safety.

Now, they also have low BCRs. They are very similar to what we see in Cedar Rapids. And I noticed that four out of the five projects were in California. Can you explain to me why the lives and livelihoods of Californians are worth more than the lives and livelihoods of Iowans, particularly since California is a very vast State with large amounts of economic resources?

General Semonite. Senator, great question. I think I said, when you were out, every single American, every single property have all the same value. We have to be able to

continue to take care of all of the Country. And Cedar Rapids has done better than almost anywhere else in figuring how to mitigate this significant challenge.

You are very, very aware you have an authorized project. The big question is the ability to be able to find funding to be able to do it, and the mayor is exactly right, there are a lot of concerns out there. We are worried. We made a significant Federal investment when it came to the authorization of that. We are continuing to figure out to do every single thing we can to try to find how we can now secure the right amount of money to be able to at least start that.

The challenge we have, and this goes back to, I think, why we are all here today, is that the requirements grossly exceed the amount of money in the Federal budget. Just the Federal dams alone, \$24 billion to be able to buy down the worst ones.

Now, we are getting funded to capacity and the Congress has done a good job of taking care of us on the Federal ones, but when it comes to all of these other areas for flood control, the question is how can we try to hit all those requirements. The best thing we can do is to continue to work with you to figure out are there other parameters or other solutions that we can somehow be able to figure out how to take care of the mayor out there.

The benefit-cost ratio can't be the right answer, because like you said, sir, we can't run this Country on an algorithm. We have to think about the passion of the people and all the work they have done out there. But right now we continue to try to champion that project the best we can. We will continue to be able to work with you. But I think at the end of the day, when the Administration has to figure out how much can we afford, elements like this are going to have to figure out are there some of those that you can then take a look at that risk and where can we afford to be able to buy that risk down.

Senator Ernst. I appreciate that, General, and I do look forward to working with you on a solution that will not only benefit those that live in more urban areas or urban States, but also those that are finding challenges in the rural areas. This is a very important project not just for Cedar Rapids, but for the well-being of the entire State of Iowa. So I will continue to push for that. I am glad that we can work together.

Mr. Chairman, I want to thank you for bringing this Committee together today to talk about these important issues. I know that we struggle with some of those same issues in Wyoming, in Iowa, in Nebraska, and I look forward to finding that solution with you. Thank you very much.

Senator Barrasso. Well, thank you very much, Senator Ernst. I look forward to continuing working with you on this,

as we discussed in the meeting in your office, the critical need for this additional work. So thank you for all your efforts.

Thank you.

Before I begin my questioning, I would like to demonstrate the impact that ice jam flooding has had in communities in Wyoming. This is the Northern Wyoming Daily News from Tuesday, February 14th. You have seen this, Commissioner Wolf.

One hundred plus homes evacuated. Ice jamming along Big Horn River causes second major flood in three years, with pictures of the Wyoming National Guard placing sandbags in Wyoming. So this is affecting different parts of the Country and I just wanted to visit with you, if I could, Commissioner Wolf, because last week many people from Big Horn County went to Grable to celebrate the life and mourn the death of our fire chief, Paul Murdoch. The gym at the high school was jammed. People came in fire trucks from all around. He died after fighting not a fire, but an ice jam on the Big Horn River in an effort to prevent flooding in Grable. He left behind a wife. He was 53. Left behind two sons. It was a real tragedy.

So can you talk about the other human consequences of the flooding, in addition to the abandoned homes and the damage and the property damage? Can you go a little bit beyond that?

Mr. Wolf. Thank you, Senator Barrasso. Yes, that was a tragic time that happened with his passing. A couple of folks

in our courthouse were family, related to him, and we extend our condolences, too.

When we look at what happened out there on the ground, when that flood inundated the homes and got close to the local businesses and displaced over 100 homes, as you had mentioned, those families were away from their homes for almost, I think, four to five nights, and when you look at the toll there, they don't know what they are going to come back to.

Law enforcement did a very good job between the Worland Police Department and the Washington County Sheriff's Department trying to get families in and out of their homes if the ability was there for them to go in and at least get some belongings to get by. I think many of them thought it was just maybe an overnight deal, but upriver of this ice jam that had already flooded we had several other jams that had not come down yet, and with the normal flood stage there right at that point where the bridges are in Worland runs at 10.5 feet. We hit a high of 15 feet, and with other ice jams coming down, we didn't want to take the chance of letting them in there and cause injury or loss of life just from people being there. Those big chunks of ice are just dangerous to be around even if the water recedes.

Senator Barrasso. You know, the pictures that you showed showing the growth of the island in the middle of the Big Horn River are striking. I think people looked at that and said,

wow. The testimony states removal of the island could be a simple and effective solution for ice jam flooding in the City of Worland. As you point out, if the Big Horn River selected, as a pilot project to demonstrate innovative solutions for ice jams, I think we could solve this problem. In fact, it may be the only way, given the cost and the bureaucratic red tape and the permits that would be required.

So, given that, do you believe that the Corps should have the good sense to step in to address situations like this, where the safety impact on the lives and the property are so great that, if a town can't afford to proceed on its own, that they should step in?

Mr. Wolf. I do think so, Mr. Chairman, that they should step in. I do look at it, though, at a State and local level there, that we need to have some skin in the game and work with the Corps in this project. There is firsthand knowledge that we have that we have seen over the years that might be able to add to some solutions to the problem that they may not see, not being there on a regular basis. One of the things that we have looked at short-term is removal of that island that is out there, sandbar that has built up over time, and reinforce the riverbank, and then also, along with that, short-term solutions would be to put in place backflow prevention that goes back into the city on the storm drains, because even though some of the

areas didn't get hit by the water overtopping banks, the water flow backed up the storm drains and flooded around buildings in some of the local areas. So that is one thing.

In the long-term, we would like to get some berms in place to tie in around the north side of Worland.

So I think we can work together, and I talked with the General earlier today and made some progress, I believe.

Senator Barrasso. That would be great.

General Semonite, can you comment on that? Do you have the ability to help towns like Worland to remove that simple island that causes so much damage each year? Or do you believe you don't have the statutory flexibility?

General Semonite. Sir, thanks for the question. Senator, I think, first of all, I want to thank you for what you did to be able to get that pilot organized, the tender for night stem actions were in work in the next five years. We have a lot of expertise in cold regions. I am from a small town in Vermont. The Connecticut River has ice jams all the time. I have seen flooding in my own town, so I certainly know the complexity that is out there.

I don't think we have a challenge with authorities, and it goes back to what you said earlier, I think, sir, when it comes to the 205 challenges, we want to be able to continue to reach out to do whatever we need to do for this Nation, whatever the

Nation needs the Corps with expertise. Sir, the only reason that we should not be able to do something is because of the lack of funding. I mean, it should be the fact that we just can't afford it, the Nation can't afford, and this is where the best thing we could do is understand the requirement, come forward to be able to articulate that in Congress, where in fact we think there could be some use of that, and then if in fact the Administration and the Congress feels that we should step up, then that is obviously a budgetary decision. But I don't think that our hands are tied, necessarily, right now from an authority perspective, Senator.

Senator Barrasso. And in terms of authority, I want to switch to something in the opening statement. I included that language in the Water Resources Development Act the Committee enacted last Congress, creating an Army Corps Pilot Program to develop innovative cost-saving technology to address the threat like this. In developing this technology, the programs would involve consultation, of course, with the co-regions research, engineering laboratory of the Corps. You talked about your upbringing and your familiarity, so will you commit, then, to work to implement this program in an expeditious manner to develop the required technologies to help alleviate these sorts of threats?

General Semonite. Sir, the language in WRDA was very, very clear exactly what the scope of that program was. We already have that under gear to figure out how would we go ahead and do it. I think the only challenge would be is if at some point we don't have the funding to be able to execute the follow-on of some of those technologies. But I think it goes back to not only what the Corps can do; how can we continue to learn not only what other areas in America do, but this happens in other places in the world. We have to get some innovation to figure out how can we somehow use technology to be able to mitigate some of this risk.

Senator Barrasso. Senator Cardin.

Senator Cardin. Thank you, Mr. Chairman. Thank you very much for holding this hearing.

As to the general concerns we have on dam maintenance, in Maryland we have 346 dams. I was surprised to learn that number. Two are under the jurisdiction of the Army Corps, and we thank you very much for the attention that has been paid to the two dams in Maryland that are under the Army Corps' supervision, the Jennings Randolph Lake, which affects Maryland and West Virginia, and in Cumberland, Maryland and Ridgeley, West Virginia.

We also have a lot of other dams in our State that are highly regulated along the Susquehanna. The Conowingo Dam is

one of the major sources of electricity in the east coast of the United States.

But I want to go to the attention of the lesser known dams that we have in our State that are no longer performing the function for which they were constructed originally. We have the Bloede Dam on the Patapsco in Patapsco State Park that I was told was the first hydroelectric dam in the Country. That might be right, may be wrong, but it is an old dam that no longer serves its function and has really no purpose. But because of the way dams are maintained and financed and owned, there is no reserve for the removal of that dam.

So that dam now is still there. It is a public safety hazard; we have had several drownings because it is on a State Park and individuals like to swim, and they swim near the dam and the currents there have caused people to lose their life. It also adversely affects our environment and the water flow; it affects farming operations in an adverse way. So I guess my question is is there any way that we can figure out how we can, either moving forward, recognize that there is a life cycle for dams and that there is a need to remove dams that no longer are useful for their intended purpose? If you have suggestions on that, I would appreciate it.

Lieutenant General, it looks like you have a thought.

General Semonite. Sir, just maybe an observation on how we are doing it, Senator. Fifteen of the worst dams, the Federal dams, equate to probably \$12 billion of repair. So the question is do we use taxpayers' money to fix all of those dams or have some of those actually outlived their point?

So of the 15, 5 of them right now we are working with Congress to divest those 5. Three of them are already basically approved, and they are in Kentucky. They will come back out. There is another one right now that Olmstead is actually replacing, so this is actually on one of the rivers. I think you have a great point. There are times that we have to take a good look at and say is it really worth the return on investment to fix a dam or, for all the reasons you stated, especially when it comes to environmental, life safety, maybe it is time to take some of those dams out. So this is where I don't know the particular dam you are talking about; it is not a Federal dam. But certainly on our side we are trying to do the same thing, because the worst thing we can do is use very, very limited taxpayers' dollars to fix a dam that doesn't actually serve the intended purpose.

Senator Cardin. Is there any experiences in the State on how you can decommission them?

Mr. Larson. Thanks, Senator. I ran the Dam Safety Program in the State of Wisconsin. We had the authority to tell an

owner either you fix it up or take it out. There may be instances, and this may be the case you are talking about, where we could not find an owner. In that case, we ask our State legislature to set up a fund to remove the dams. I think the States need to step up and do that. They are not Federal dams. These are non-Federal dams. And we did, we had a fund where we removed those dams that were no longer serving a purpose.

Mr. Laird. And, Senator, we have removed just a high profile one in Monterey County. We have an agreement with Interior and the State of Oregon to remove four dams on the Klamath River. There is one in Ventura County that has silted up to the point that, by 2020, it will have a zero percent capacity and we will have what was once a 7,000-acre foot dam completely with silt ponded.

And you nailed the problem. We raised the money from private donors and different public funds to deal with these dam removals because they were safety, it was fish, it was outlived the usefulness. And some of the ratepayers had to contribute, but in some of these cases they are on such a small base and the cost for removing the dam is so big that we have to leverage some other money.

Senator Cardin. And we have no responsible party, I understand, that would pay to remove this dam. Therefore, we have to look for either a public source or some way in which

there is a broader base to pay for removal of the dam. Your experiences could be very helpful to other States, so one of the things I guess I would encourage is that this subject be best practices shared as to how you were able to do this, because in my State we have been unable to take care of this circumstance.

Thank you, Mr. Chairman.

Senator Barrasso. Thank you very much, Senator Cardin.

Senator Gillibrand.

Senator Gillibrand. [Remarks made off microphone.] -- New York State because we have quite a lot of dams. New York is particularly vulnerable because, according to the American Society of Civil Engineers, we are actually eighth in the Nation when it comes to high hazard potential dams. The average age of our dams are nearly 70 years old.

New York is also vulnerable to major storms and flooding associated with storm surges along our coast. Hurricane Irene and Tropical Storm Lee resulted in major flooding across New York State; massive damage to homes and businesses and lives. During Hurricane Irene and Tropical Storm Lee, New York failure of three low hazard and one intermediate hazard dams.

We are very fortunate that prior to those storms important repairs were made in some instances, one particularly with the Gilboa Dam in Schoharie County, absent which we may have seen

far more devastation in the Mohawk Valley and the City of Schenectady.

Now, while New York State has a strong and longstanding dam safety program in place, we do not know where or when the next storm will occur, and whether it will be more intense than the last. So I think we really can't have a serious conversation about the safety of dams, levees, and other flood infrastructure without also addressing the impacts of climate change and extreme weather.

Sea level rise and storm surge threatens infrastructure all across our coast. Increased amount of precipitation due to hurricanes, nor'easters, or other extreme weather events threatens our dams and levees as well.

So, first, does the Army Corps provide any guidance to States to help them take the potential impacts of global climate change into account when carrying out their dam safety programs?

General Semonite. Senator, thanks for the question. Yes, we certainly do provide a lot of capability. We have a lot of regional expertise. I said earlier we have 5,000 dam safety experts in the Corps. So even in the New York district you have several districts that work in the State of New York. All of those people are there able to provide that capability.

We have also found that we have to be able to localize some of the real, real high end experts in a regional center, so we

have built some regional centers. Mr. Helpin, sitting right behind me, he runs our national dam safety center, so not only are we able to come and help in a State capacity, but whatever we can do on any of our technical competence or be able to show lessons learned, we are certainly willing to do that. We are Mosul, Iraq, fixing that dam in Iraq right now because we are that level.

So the challenge is going to be what is the level of support that we can give and how do we work that through on a reimbursable basis, because that is how the Corps works, but we are more than willing to partner if there are any specific issues you have in New York that I can help with.

Senator Gillibrand. Well, what steps do you actually take to focus on resiliency? What can you take to make sure a dam is more resilient to handle extreme weather?

General Semonite. So I think there is the physical piece, first of all. Some of the things that we have learned on our dams, on our structures: how do we go back in and worry about vegetation; how do we worry about making sure that the right inspections are done; the technical competency. I think the softer side is another big area, though. What are we doing and how do you mitigate that? Things like in our Federal dams, ma'am, we have these water control manuals, so we know how much water do we want to keep in the dam; where do we see the storm

coming; how do we bring that back down. Obviously, that is a balance with drought.

So the more that we can do this through technical affiliations or relationships and we can give some advice, I think that is one of the things that we can certainly offer; not just necessarily a structural fix, but how do we continue to work this through a risk-informed decision-making process to be able to make sure the whole entity is engaged.

Senator Gillibrand. And when you are assessing if something is a high hazard dam or not, are future climate change impacts taken into consideration in making that judgment? I will just give you an example. In New York we have 7,000 dams, and 403 of them are classified as high hazard dam structures. Arguably, would more be classified as high hazard if you were also taking into account future climate change impacts?

General Semonite. Senator, we look at climate change, sea level rise with every single thing we do. When we are going to build a new structure, we obviously put that into the design.

I think the other thing that is really most important is not so much the fact of where the water is going to be, but how that water comes. Some of the other testimonies today talked about flashes. In California right now we are very concerned about this pineapple express type scenario where you could have a lot of microbursts happen all at once. So it is not just the

fact of where the water is, but how is that water going to come. And if it is going to come so fast that the system can't pass that water in a manner, then that is when we really have the challenges out there.

Senator Gillibrand. And so you are you analyzing those sets of facts when judging which dams are critical?

General Semonite. Yes, Senator, exactly right.

Senator Gillibrand. Thank you.

Thank you, Mr. Chairman.

Senator Barrasso. Well, thank you very much.

Everyone has had one round of questions. I didn't have any other.

Senator Harris, anything else?

Well, I want to thank all of our guests for being here. I think this was very, very helpful for all of us. Some of you traveled long distances. I appreciate all of the witnesses for being here.

At this time, I ask unanimous consent to place into the record additional testimony we received from the Association of State Dam Safety Officials and the Upper Mississippi, Illinois, and Missouri River Association and the Flood Plain Alliance for Insurance Reform. So, if there is no objection, those will be included in the record.

[The referenced information follows:]

Senator Barrasso. I do also want to note that this record will stay open for the next two weeks, and there may be other members of the Committee, because of the votes, who had to leave who may submit written questions, and we would hope that you could get back to us quickly with those.

But, otherwise, thank you to each and every one of you for being here. I am very grateful for your time.

This hearing is adjourned.

[Whereupon, at 12:18 p.m. the committee was adjourned.]